System Wide Information Management

(SWIM)

Governance Plan

Version 2.1

March 9, 2009

Revision History

Date	Version	Description	Author
June 1, 2008	1.0	Initial Draft	Bill Clarke, AgilePath
September 26, 2008	2.0	Final	Jim Robb, SWIM
March 9, 2009	2.1	Minor Revisions	Bob Olsen, North Star Group

Contents

1.0 Introduction

1.1 Purpose

This plan documents the SWIM Program policy, objectives, responsibilities and structure for governance of the SWIM Service Oriented Architecture (SOA).

1.2 Scope

This plan applies to all SWIM participants, stakeholders and activities. Activities sponsored by SWIM will support the objectives of this plan; however, requirements and specific responsibilities outside the SWIM program office will be specified in a Program Level Agreement (PLA) for Segment 1 between SWIM and each of the SWIM implementing programs (SIPs).

1.3 Background

The FAA is developing and modernizing many complex interdependent Air Traffic Management (ATM) systems using modern technologies, software methods, and system architectures that provide fundamental support to the transition to network-centric ATM operations. Concurrently, the evolving service-oriented computing paradigm leads to NAS interfaces being defined, developed, and implemented as services, rather than as system-dependent functions. This will provide increased interoperability, greater potential for software re-use and reduced total cost of ownership.

This modernization is occurring alongside formulation of revolutionary new ATM concepts and the process re-engineering of every facet of operations (e.g., separation assurance, strategic flow management, dissemination of aeronautical and flight data, and airspace user interaction with NAS infrastructure). The Joint Planning and Development Office (JPDO), through its development of the *Operational Concept for the Next Generation Air Transportation System (NextGen),* targeted the completion of this effort for the 2025 timeframe. Achieving NextGen requires a suite of Core and Enterprise Services comprised of both the net-centric infrastructure providing the connectivity and universal access to information and by the services that provide the collection, processing and distribution of information.

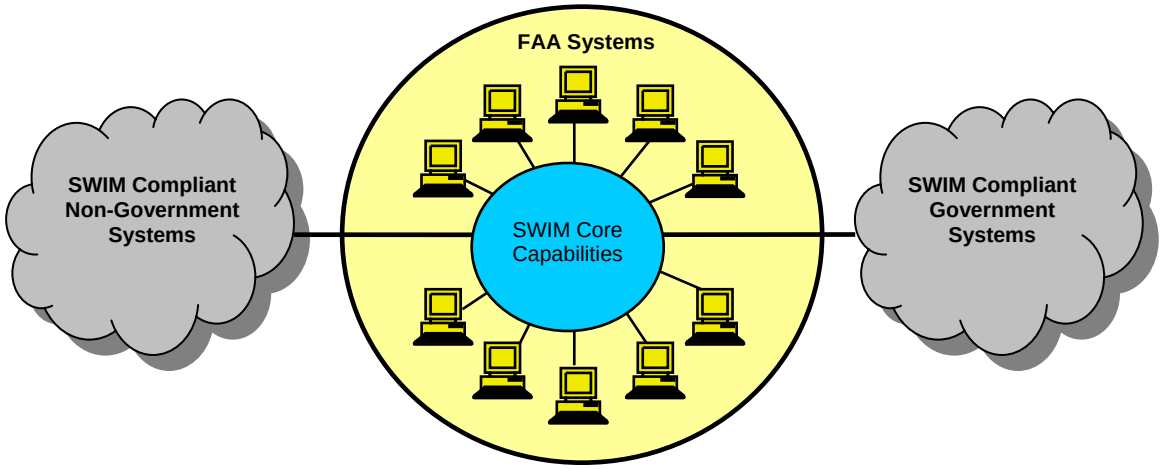

Figure 1 SWIM-Enabled Interoperability

The purpose of SWIM is to facilitate net-centric NAS operational improvements (including some proposed in the NextGen). SWIM capabilities apply state-of-the-art information management and exchange technologies to ensure information is available to SWIM-enabled systems to improve the speed, efficiency, quality and extent of distributed decision-making. Information can be automatically provided to users with a known need and to new users as needs arise – with far less expense and complexity than current methods. SWIM-enabled systems have the ability to request and consume information when they need it, subscribe for automatic receipt, and publish information and services as appropriate.

1.4 SOA Concept Overview

The SWIM concept leverages the Service Oriented Architecture (SOA) paradigm. SOA is an approach to integrating applications running on heterogeneous platforms using common standards. A service is a set of well defined, self-contained functions (or operations) offered by a software system. With SOA, a service can be available using any SOA standards compliant communication protocol (procedure for transmitting and receiving data) and any SOA standards compliant data format. SWIM provides both the SOA technology infrastructure and the information management standards and processes needed for consistent service development, operation and management enterprise-wide.

By observing SOA standards and principles, SWIM makes services available on a network, and systems on the network seeking those services can invoke them without having to change or adapt to the underlying implementation of the service (i.e. loose coupling). SWIM leverages the

FAA Telecommunications Infrastructure (FTI) that is planned to replace the functionality currently provided by several owned and leased transport systems. While FTI provides network-level connectivity and security, SWIM provides a means for a system to obtain needed information from another system that is the source of that information (application integration).

The SWIM concept draws on the Department of Defense's (DoD) Global Information Grid/Network Centric Enterprise Services (GIG/NCES) model and will allow efficient interoperability among NAS operations systems. SWIM can also provide interoperability of these NAS operational systems with NAS mission support systems and other SWIM-compatible systems operated by non-Government NAS users (e.g., commercial air carriers), and other Government agencies such as the DoD and the Department of Homeland Security (DHS).

2.0 References

DoD Net-Centric Enterprise Services Capability Development document

AgilePath Governance Playbook as a partial framework for governance.

FAA Acquisition Management System (AMS), (available on http://fast.faa.gov/)

SWIM Implementation Team Plan v1.0

SWIM Program Level Agreement v1.1

SWIM Configuration Management Plan v2.1

SWIM Governance Policies

3.0 Organization and Responsibilities

The SWIM governance model divides governance responsibilities between the SWIM Program Office (PO), NAS Enterprise Architecture Board, NAS Configuration Control Board, and NAS Programs/IPs. There are three primary entities within the SWIM PMO that have key roles in SWIM governance, the SWIM Requirements and Governance, the SWIM Implementation Team, and the SWIM Configuration Review Board. The responsibilities of each of these entities and the NAS Programs/SIPs are detailed below.

3.1 SWIM Governance Organization

The SWIM Governance Organization is based upon a distribution of responsibilities between the NAS Enterprise Architecture Board, NAS Configuration Control Board, the SWIM Requirements and Governance team, the SWIM Implementation team, the SWIM Configuration Review Board and NAS Programs. Each team has a specific set of functions that contribute to a cohesive SOA governance approach. The NAS EAB serves as the technical review board that will utilize the SOA Suitability analyses to determine SWIM compliant programs. The SWIM CRB interacts with the NAS CCB via the Communications CCB. The SWIM PMO interfaces with the NAS Programs via the SWIM Implementation Team.

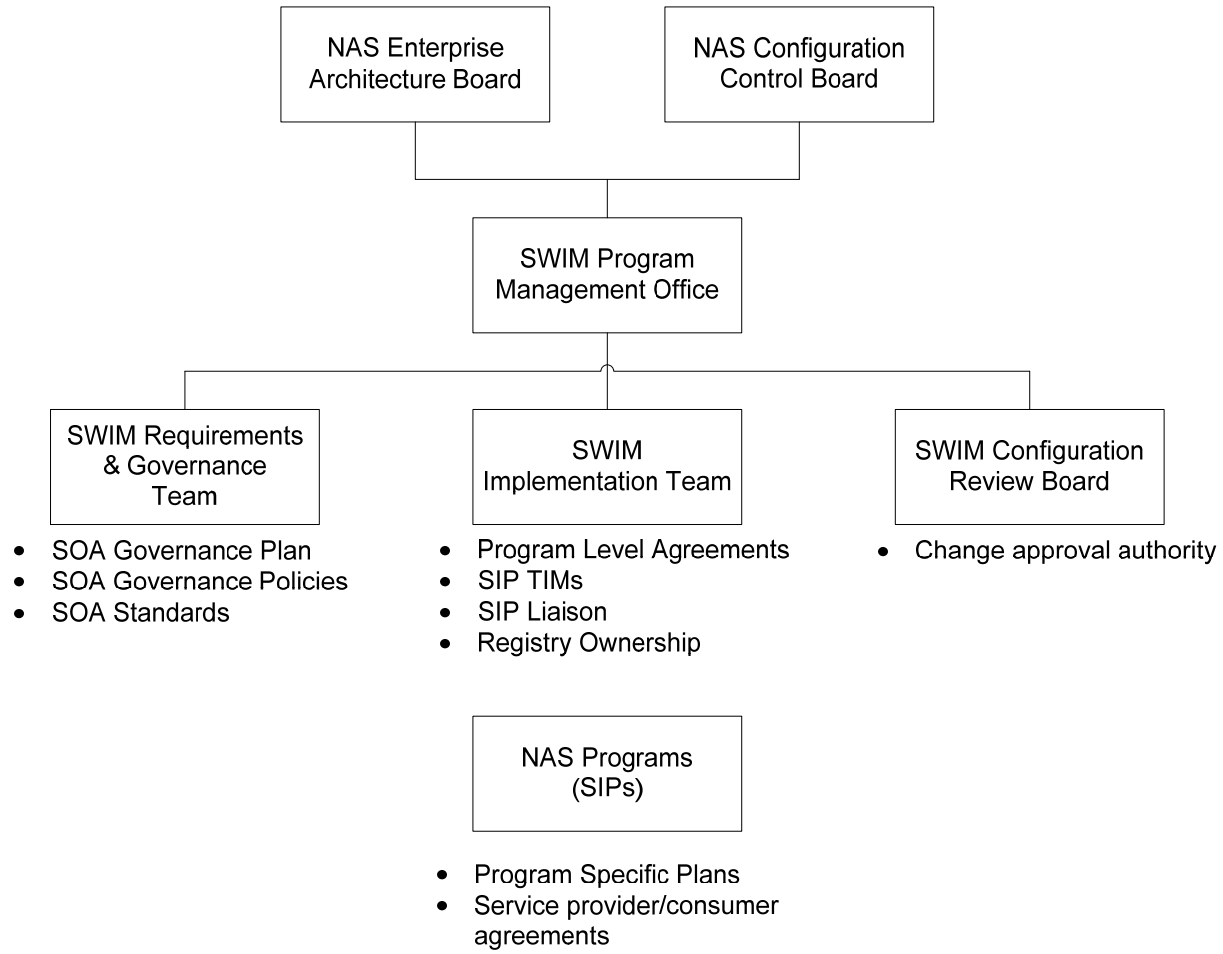

Figure 2 SWIM Governance Model

3.2 SWIM Program Management Office

The SWIM Program Management Office serves as the SOA oversight authority for all SWIM services. The SWIM PMO accomplishes this function through a combination of entities to

include the SWIM Requirements and Governance team, the SWIM Implementation team, and the SWIM Configuration Review Board. Specifically the SWIM PMO:

- Assures the quality, standardization, interoperability and availability of SWIM services.
- Reviews and approves selected processes used by SIPs to ensure the quality, interoperability and availability of SWIM services.
- Reviews and approves services proposed as SWIM core services via the SWIM Configuration Review Board (CRB).
- Determines if a SIP service or any other proposed NAS service is SWIM compliant.
- Reviews and compiles requirements for all SWIM candidate services.
- Works with the SIPs to reduce services redundancy and resolve service conflicts in the event that they occur.
- Establishes and maintains a central registry for all SWIM services.
- Advertises services that are available for re-use.
- Collects metrics on SWIM services usage and PLA compliance for quality review and program metrics.

3.3 SWIM Requirements and Governance Team

The SWIM Requirements and Governance team serves as the SWIM SOA governance authority for all SWIM services. The SWIM Requirements and Governance team accomplishes this function through the use of the SWIM Governance Plan, Policies and Standards. Specifically the SWIM Requirements and Governance team:

- Develops and maintains all SOA policies and processes.
- Develops and maintains FAA SOA standards for the NAS.
- Assists SIPs and NAS Programs with performing SOA Suitability analysis

3.4 SWIM Implementation Team

The primary responsibility of the SWIM Implementation Team is to assist and support the SIPs in Segment 1 as they design, develop, test, and deploy their programs to facilitate SWIM. This

will involve high-level governance with respect to SWIM-related functionality including but not limited to coordinating activities, reviewing documentation, observing testing, collecting and monitoring metrics and program data, and providing laboratory facilities. In addition to supporting the SIPs, the team will be responsible for performing administrative and programmatic functions such as facilitating meetings and coordinating with other SWIM functional teams. The SWIM Implementation Team will use the following mechanisms to accomplish these objectives:

- Program Level Agreements – The PLAs identify the tasks and activities that the SIPs need to perform in order to satisfy SWIM PMO requirements. The PLAs include JRC-approved funding levels, proposed schedules, required products, and a list of SWIM Government-Furnished Equipment (GFE). SIP specific PLAs may alter program specific requirements.

- Earned Value Management – The SWIM PMO is responsible for maintaining an Earned Value Management System (EVMS) in order to plan and control costs, measure performance, and identify variances in costs and schedule. In turn, the SIPs will be responsible for reporting this information on a monthly basis to the SWIM Implementation Team. The Cost Performance Reports (CPRs) will report on the efforts of FAA personnel, support contractors and development contractors.

- Documentation Review – In accordance with the SIPs' SWIM PLAs, the SIPs will provide reports and products during the design, development, test, and deployment of SWIM Segment 1 capabilities which will be maintained on the SWIM KSN Home page.

- Design and Program Reviews – Throughout the design and development process, the SIPs will conduct Design Reviews and Program Reviews. The SWIM Implementation Team POC will be expected to attend these reviews in order to monitor the status of the SIP's progress, identify any issues which may impact the SIP's ability to facilitate the SWIM capability, and provide technical assistance.

- Capability Testing Requests – Each SIP will provide a Test Management Plan (TMP) and test procedures or similar test documentation that includes a description of the plan for testing the capability as well as a matrix that maps which requirements will be tested in each

phase of testing. Members of the SWIM Implementation Team will review and comment on all test documentation in sufficient time so that the SIPs will be able to respond and modify the plans and procedures prior to testing.

- Post-Implementation Reviews – The SWIM Implementation Team is responsible for ensuring that the SIPs plan for and conduct Post-Implementation Reviews (PIRs) for their SWIM Segment 1 services. The purpose of the PIR is to assess actual program results against baseline expectations to determine whether the investment program is achieving performance and benefit targets; the investment program is meeting the service needs of customers; and the original business case is still valid. The PIR will assess actual investment costs, schedules, benefits, performance, and mission outcomes against appropriate measures of effectiveness.

3.5 SWIM Configuration Review Board

The SWIM Configuration Review Board serves as the SWIM governing body for all baseline changes related to SWIM services. Specifically the SWIM Configuration Review Board:

- Approves and controls changes to approved SWIM system baselines and standards in accordance with the SWIM Configuration Management (CM) Plan maintained on the SWIM Home page.
- Serves as a forum for the disposition of SWIM upgrades/modifications and the resolution of design, interface, commonality, and schedule issues.
- Approves and controls changes to developmental baselines and work products for Segment 1 programs.
- Administers change management process as defined by the SWIM Configuration Management Plan

3.6 SWIM Implementing Programs (SIPs)

SWIM Implementing Programs (SIPs) are responsible for the implementation of the SWIM nine capabilities in Segment 1: En Route Automation Modernization (ERAM), Traffic Flow Management (TFM), Aeronautical Information Management (AIM), Terminal, Corridor Integrated Weather System (CIWS), Integrated Terminal Weather System (ITWS) and Weather Message Switching Center Replacement (WMSCR). Specifically the SWIM Implementing Programs:

- Identify service re-use opportunities.
- Determine how the SIP's lifecycle process matches with the SWIM defined service lifecycle to ensure the SIIIP's readiness for transition from each SWIM program defined lifecycle stage to the next. This matching is subject to review by the SWIM PMO via the Implementation Team.
- Determine the functionality of candidate services and enhancements.
- Require contractors to use SWIM service container software.
- Identify a service owner for each offered service.
- Develop and maintain a Service Level Agreement for each offered service with service consumer(s).
- Maintain an entry in the SWIM repository/registry for each offered service.
- Develop and implement designs in accordance with FAA-STD-060, Data Standard for the National Airspace System (NAS).
- Develop and implement designs in accordance with FAA-STD-063, Standard XML Namespaces.
- Develop and implement designs in accordance with FAA-STD-064, Service Registration.
- Develop and implement designs in accordance with FAA-STD-065, Web Service Specification Standard.
- Develop and implement designs in accordance with FAA-STD-066, Web Service Taxonomies Standard.
- Implement data management in accordance with FAA Order 1375.1, Data Management.
- Develop a governance approach to support Operational Contingency Plan.
- Develop a governance approach to support Business Contingency Plan.
- Develop a governance approach to support Security Certification and Authorization Packages.
- Review and comment on SOA governance and standards documents.

3.7 National Airspace System (NAS) Programs

National Airspace System programs are responsible for the implementation of programs that provide enhanced technical and operational capabilities to the FAA. NAS programs perform an initial analysis to determine the suitability of a SOA based solution. The functions specified below apply to NAS programs that are implementing SOA based services. Specifically the NAS Programs:

- Perform a SOA Suitability analysis assessment to determine if a service oriented approach is warranted.
- Identify service re-use opportunities.
- Determine how the NAS program's lifecycle process matches with the SWIM defined service lifecycle to ensure the NAS program's readiness for transition from each SWIM program defined lifecycle stage to the next. This matching is subject to review by the SWIM PMO via the Implementation Team..
- Determine the functionality of candidate services and enhancements.
- Require contractors to use SWIM service container software.
- Identify a service owner for each offered service.
- Develop and maintain a Service Level Agreement for each offered service with service consumer(s).
- Maintain an entry in the SWIM repository/registry for each offered service.
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- Develop and implement designs in accordance with FAA-STD-066, Web Service Taxonomies Standard.
- Implement data management in accordance with FAA Order 1375.1, Data Management.

4.0 SOA Policies and Processes

The SWIM Requirements and Governance Team has developed a set of SOA policies and supporting processes to provide guidance to the NAS Programs whether they are service providers or service consumers regarding responsibilities, workflow and interdependencies. These policies are crafted to support the overarching goals of ensuring service interoperability, and promoting reuse of existing services. In this context processes are defined as a documented and structured set of activities that support the implementation, maintenance and enforcement of policies. Policies are intended to be adopted by NAS Programs and are designed to provide specific guidance regarding best practices implementation of a SOA based solution and are subject to enforcement via the governance entities described in section 3. The SWIM SOA policies defined in Appendix A are detailed in the SWIM Governance Policy document and are grouped into the three categories defined below.

1. Strategic SOA Policies: set the overall direction and priorities of the SOA initiatives to ensure alignment between services and business priorities.
2. Service Design-Time Policies: guide the design, development, and operation of services and SOA infrastructure.
3. Run-time and Operational Policies: guide the day-to-day governance that includes monitoring, auditing, demand management, and service utilization.

Policies will be developed and published using a phased approach to ensure that those policies critical to the initial building block components, such as the registry, are created and published during Segment 1. Existing policies will be refined and new policies will be published as required.

5.0 SOA Suitability Analysis

The SWIM PO has developed a SOA Suitability Analysis process and tool to aid in determining the suitability of Joint Resources Council (JRC) development programs for a SOA based solution. Analysis is performed using a set of criteria designed to objectively assess the SOA suitability of a program. This information is provided to the JRC and Enterprise Architecture Board to assist them with their decision making process as part of the AMS. The diagram below provides a high-level summary of the process flow. Results of these analyses can be found in the SWIM Requirements and Governance KSN site under the SOA Suitability folder.

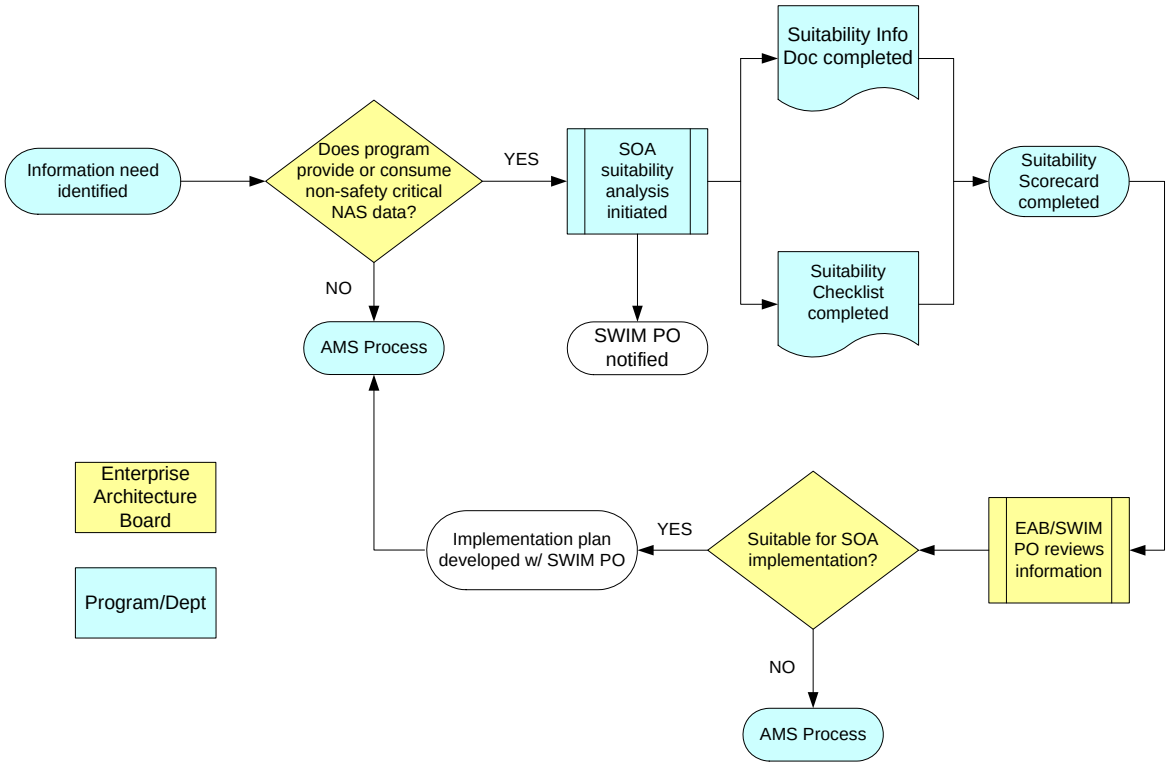

Figure 3: SOA Suitability Process

Appendix A – GOVERNANCE POLICIES

These policies will be maintained on the SWIM Requirements and Governance and SIP KSN sites.

3.0 STRATEGIC SOA POLICIES.

- 3.1 SOA Technology Acquisition Policies
- 3.2 Enterprise Architecture Policies
- 3.3 SOA Opportunity Management Policies
- 3.4 Interoperability, Reuse and Standards Policies
- 3.5 Registry Policies

4.0 SERVICE DESIGN-TIME POLICIES

- 4.1 Namespace and Schema Policies
- 4.2 Service Interface Design Policies
- 4.3 Services Technical and Design Policies
- 4.4 Information Security Policies
- 4.5 Service Development Process Policies
- 4.6 Service Lifecycle Management Policies
- 4.7 Service Registration, Publishing and Advertising Policies
- 4.8 Service Operational Readiness Policies
- 4.9 Service Provisioning Policies
- 4.10 Service Consumer Policies

5.0 RUNTIME AND OPERATIONAL POLICIES.

- 5.1 Messaging and Routing Policies
- 5.2 Operational Security Policies
- 5.3 Service Management Policies
- 5.4 Maintenance and Support Policies

Appendix B - ACRONYMS

AMS	Acquisition Management System
ATM	Air Traffic Management
BPEL	Business Process Execution Language
BPM	Business Process Management
CM	Configuration Management
CRB	Configuration Review Board
DHS	Department of Homeland Security
DOD	Department of Defense
CPR	Cost Performance Reports
EVM	Earned Value Management
FTI	FAA Telecommunications Infrastructure
GFE	Government Furnished Equipment
GIG/NCES	Global Information Grid/Network Centric Enterprise Services
JPDO	Joint Planning and Development Office
JRC	Joint Resource Council
KSN	Knowledge Services Network
NAS	National Airspace System
NextGen	Next Generation Air Transportation System
PIR	Post-Implementation Reviews
PLA	Program Level Agreement
PMO	Program Management Office
POC	Point of Contact
SDLC	Service Development Lifecycle
SIP	SWIM Implementing Program
SOA	Service Oriented Architecture
TIM	Technical Interchange Meeting
TMP	Test Management Plan
XML	Extensible Markup Language